

Precipitation since May improved wetland conditions in portions of central and eastern Prairie Canada, but much of the western prairies remain dry. The precipitation came too late for initial nesters, but should help re-nesters and should improve brood survival. Overall, production from southern Saskatchewan and Alberta is expected to be only fair to poor. The July brood production survey was not conducted this year due to USFWS budget constraints, but limited flights during July over certain areas confirmed reports of improved wetland conditions due to rain that came after the May survey. Although recent rains may improve habitat status going into fall, several years of wet growing seasons are needed for vegetation to reach optimal conditions for breeding waterfowl.

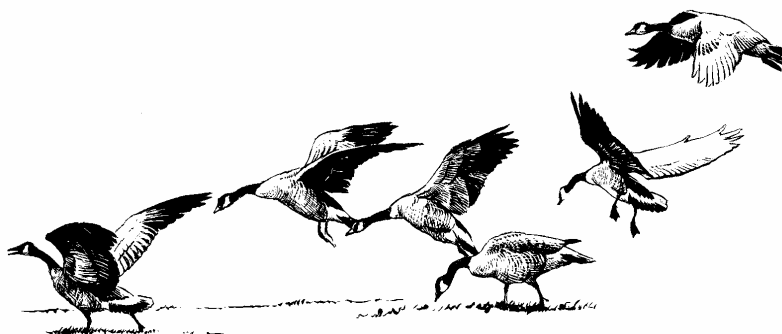
### **Duck Populations:**

Total duck numbers in the traditional survey area decreased 11% from 36.2 million in 2003 to 32.2 million in 2004, and were 3% below the long-term average. Duck numbers were generally down in southern Canada (S. Alberta -7%, S. Sask.-38%, S. Manitoba -7%) but increased by 15% in northern Saskatchewan, northern Manitoba, and western Ontario. Increases in northern areas are often noted when the southern prairies are dry. Blue-winged teal numbers (4.1 million) declined 26% from last year and were 10% below the long-term average. Northern shovelers and American Wigeon were 22% below 2003. Gadwall (+56%), green-winged teal (+33%), and shovelers (+32%) were above their long-term averages. Northern pintails (-48%), American wigeon (-25%) and scaup (-27%) were below their long-term averages. Canvasbacks were slightly above their long-term average (+10%).

**Mallard Fall Flight:** The 2004 breeding population estimate for mid-continent mallards of 8.36 million (7.4 million in the traditional survey area plus .93 million in Michigan, Minnesota, and Wisconsin), is similar to the 8.8 million estimate of 2003. The fall flight index for mallards is projected to be 9.4 million, compared to 10.3 million in 2003.

### **2004 GOOSE STATUS**

Canada geese that migrate to Missouri include birds from 4 different populations. Tallgrass Prairie Population Canada geese migrate from near the Arctic Circle on Baffin Island, the Eastern Prairie and Mississippi Valley populations originate from west Hudson Bay in northern Manitoba and



Ontario, and giant Canada geese nest in more temperate areas including Missouri. Geese from different populations survive, reproduce, and are harvested at different rates. Each population experiences different breeding conditions each year. As a result, population-specific information is needed to assess annual status and to develop appropriate regulations recommendations.

### Eastern Prairie Population:

The Eastern Prairie Population (EPP) of Canada geese nests in Northern Manitoba and primarily migrates/winters through Manitoba, Minnesota, Iowa, Missouri, and Arkansas (Figure 8). An EPP objective of 200,000 geese was approved by the Mississippi Flyway Council in March 2000 (MFTS 2000). Harvest strategies from the 2000 Plan, however, are not based on the 200,000 total population objective. Instead, harvest management recommendations are based only on the number of geese represented by singles and pairs in the population (145,000 objective). Annual regulations and management decisions are based on plan objectives and results from the EPP breeding ground survey and from ground-based nesting and production surveys conducted near Cape Churchill, Manitoba.

Figure 8. EPP range and migration areas.

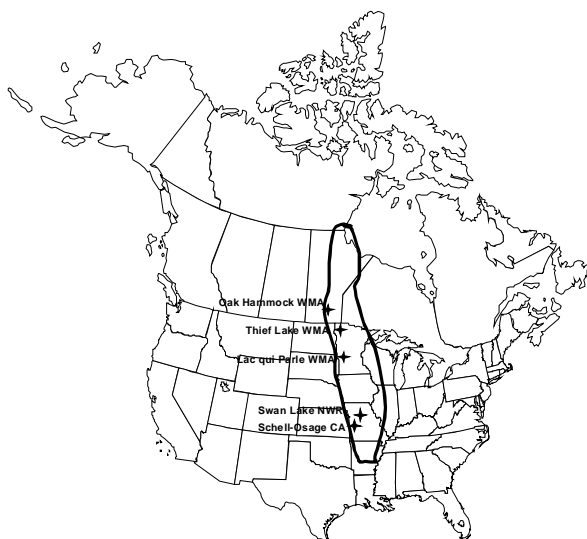
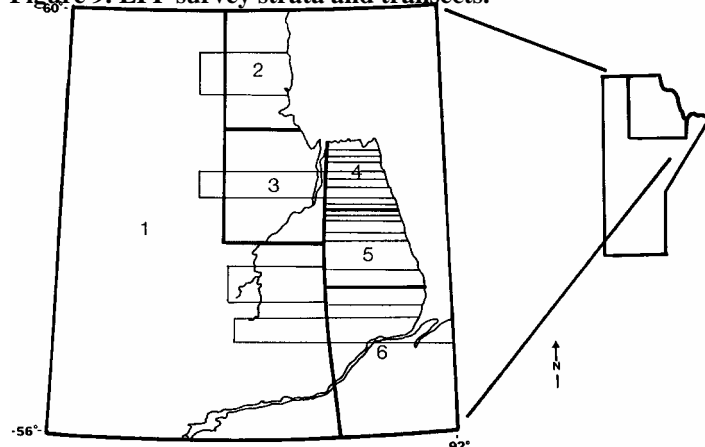


Figure 9. EPP survey strata and transects.



Surveys of the EPP have been conducted since 1972 and reflect population and nesting effort (Figure 9). Geese observed on the survey consistently have been recorded as singles, pairs, groups, and numbers of geese per group, and singles or pairs with nests or broods. Estimates of numbers of geese among these components reflect changing EPP composition among years.

Breeding phenology in 2004 was the latest recorded (1976-2004). As a

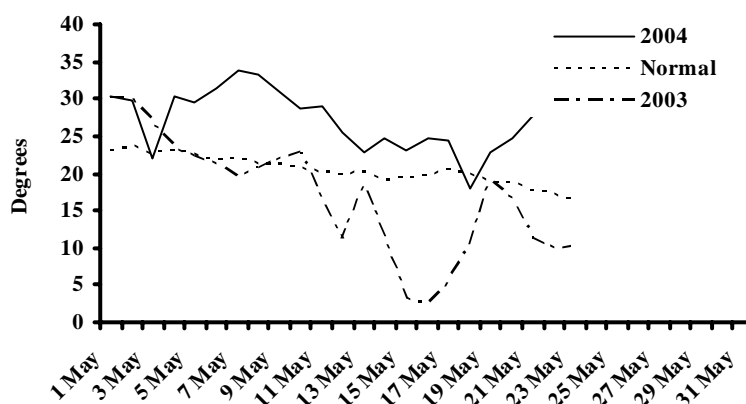
result, the aerial survey was conducted much later than normal, 16-20 June, by Brian Lubinski (USFWS, pilot), Paul Telander (Minnesota DNR, observer), and Andrew Raedeke (Missouri DOC, observer). A Partenavia PN-68 Observer was used for the 20th consecutive year. May 2004 temperatures were the coldest among survey years (1972-2004) with an average daily temperature of  $-8.1^{\circ}\text{C}$  compared to  $3.4^{\circ}\text{C}$  in 2003 and the 1972-2004 average of  $-0.7^{\circ}\text{C}$ . Cold temperatures contributed to late snow melt and late nesting phenology. Heating-degree days in May (807, Figure 10) surpassed the previous high among survey years of 802 heating degree days recorded in May 1983, and nearly doubled the number of heating degrees in May 2003 (457) (Figure 11). Range-wide vegetation, snow and ice conditions all indicated a late spring. Cape Churchill was 50% snow covered as late as 16 June (D. Andersen, pers. Comm.). At the

time of the survey, most large lakes remained at least partially ice covered in the northern reaches of the EPP range and only the most southerly portions were completely ice free.

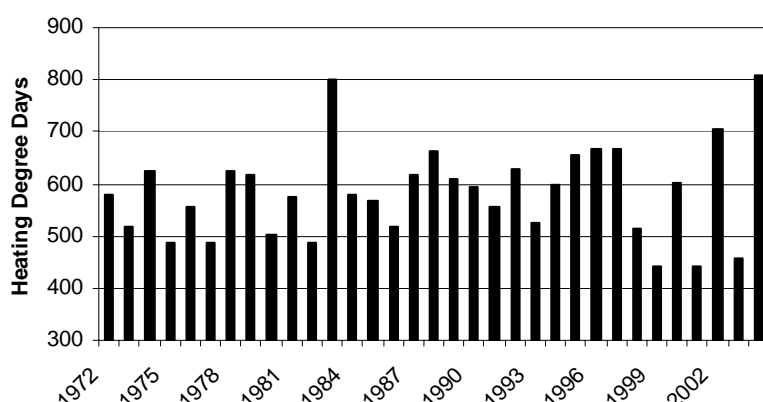
Extensive snow drifts were present on the lee side of willow, alder, and spruce stands, with slightly better conditions existing in the interior and in the southern portion of the EPP range. No vegetation had leafed out with the exception of the south

where some sedge was beginning to show green in a few isolated locations. Coastal portions of the range were wetter than normal as a result of above average snow and the interior was normal to

**Figure 10. Heating degree days during May 2003 & 2004, vs. normal.**



**Figure 11. May heating degree days by year at Churchill, Manitoba.**



slightly below normal (R. Romaniuk, pers. comm.). Interior lakes and streams were at normal levels and smaller streams near the coast were at or above flood-stage.

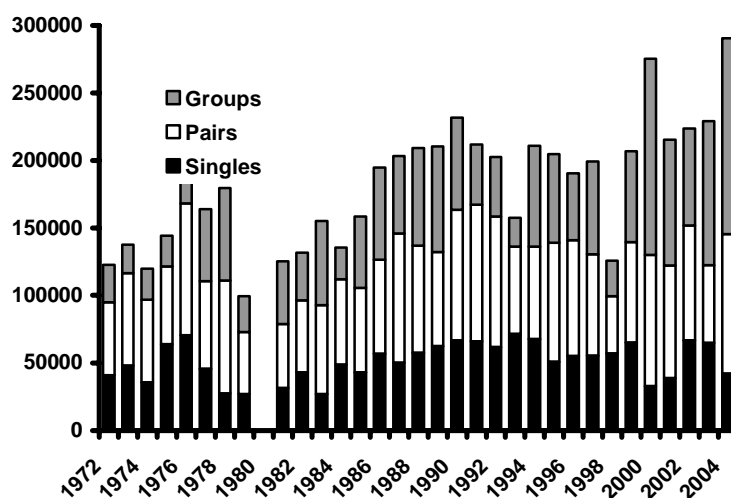
**Total EPP:** The 2004 EPP estimate of  $290,700 \pm 36,800$  geese was higher ( $P=0.016$ , 2-tailed Z test) than the estimate in 2003 ( $229,200 \pm 33,500$ ), and exceeds the EPP Plan objective of 200,000 geese. (Figure 12).

**Geese in groups:** The estimate of  $145,200 \pm 32,300$  geese in groups was similar ( $P=0.087$ ) to the 2003 estimate of  $106,800 \pm 29,700$ , and similar to most estimates in the past 5 years (Figure 12). Grouped geese accounted for 50% of the EPP population in 2004 compared to the range of 32-53% from 2000-2003 and 15-37% from 1972-1999. The influence of molt migrant giant Canada geese continues to confound interpretation of breeding ground survey results. The late timing of this year's survey likely increased the presence of molt migrant geese. The coastal estimate ( $90,900 \pm 26,300$ ) was similar to the record high of  $82,500 \pm 28,100$  in 2003 ( $P=0.670$ ) and the interior estimate increased from  $24,300 \pm 9500$  in 2003 to  $54,300 \pm 18,700$  ( $P=0.005$ ).

Based on guidelines in the 2000 EPP Plan, larger groups in interior strata (>15 geese/group – most likely giant Canada geese or interior Canada geese from other populations, e.g., MVP, SJBP) were excluded from EPP estimates. Five groups >15 were observed in interior habitats in 2004 (20, 24, 25, 28, and 36, excluded from EPP estimate).

*Singles:* The extremely late nesting season in 2004 resulted in lower ( $P=0.001$ ) numbers of single geese ( $41,900 \pm 7,300$ ) compared to 2003 ( $64,800 \pm 10,700$ ). The 2004 estimate was more reminiscent of the period from 1977-1985 when estimates of singles ranged from  $26,900 \pm 6,300$  to  $48,600 \pm 8,500$ . The extent of decline from 2003 was similar in coastal and interior

Figure 12. Numbers of EPP geese represented by singles, pairs, and groups.



habitats with a decline from  $32,600 \pm 7,000$  to  $20,400 \pm 3,800$  ( $P=0.002$ ) in the coastal strata and from  $32,200 \pm 8,200$  to  $21,500 \pm 6,300$  ( $P=0.045$ ) in the interior strata.

*Pairs:* The estimate of  $103,600 \pm 16,200$  geese in pairs was higher ( $P<0.001$ ) than 2003 ( $57,600 \pm 11,200$ ), but similar to estimates in 1976, 1987, 1990, 1991, 1992, and 2000. In the coastal strata, the estimate of geese in pairs increased from  $32,200 \pm 7,500$  in 2003 to  $55,100 \pm 12,000$  ( $P=0.002$ ), and in the interior strata from  $25,300 \pm 8,200$  to  $48,500 \pm 11,000$  ( $P=0.001$ ).

*Singles and pairs:* A combination of geese observed as singles and in pairs is the basis for decisions about EPP harvest management. Pairs plus singles likely include geese actively nesting in the current year as well as those likely to nest in the near term. This year's estimate of  $145,500 \pm 19,800$  is near the 2000 EPP Plan objective of 145,000, similar ( $P=0.091$ ) to last year's estimate of  $122,400 \pm 18,100$ , and similar to the 2002 estimate of  $152,000 \pm 19,100$ . The 2004 coastal estimate ( $75,400 \pm 14,500$ ) was similar to the 1986-2002 average ( $68,800 \pm 13,300$ ), as was the interior estimate ( $70,100 \pm 13,500$  vs. 1986-2002 average,  $69,800 \pm 12,600$ ).

*Productive Geese:* We believe numbers of geese nesting are best reflected by a combination of single geese, pairs seen with nests or broods, and geese initially observed as a single (e.g., goose flushed from a nest) and joined by another bird (likely the gander). "Productive geese" do not include pairs that are not seen associated with a nest or brood. Numbers of productive geese declined from  $70,700 \pm 11,400$  in 2003 to  $48,100 \pm 7,900$  ( $P=0.001$ ), the lowest level since 1984 when this metric was first tallied, with the exception of 2000 ( $40,800 \pm 7,900$ ). The decline was the most pronounced in the coastal habitat where numbers of productive geese dropped from  $38,000 \pm 7,800$  to  $23,700 \pm 4,300$  ( $P=0.003$ ). Numbers of productive geese in the interior habitat were similar in 2004 and 2003 ( $24,300 \pm 6,600$  in 2004 vs.  $32,700 \pm 8,200$  in 2003,  $P=0.097$ ).

The 2004 estimate of  $2,200 \pm 1,100$  nests points toward a poor production year. Nesting effort also is indicated by the count of nests observed during transects (32 in 2004, 44 in 2003, 126 in 2002, 81 in 2001, and 57 in 2000) and during low-level surveys near the Hudson Bay coast ( $n=21$ , 0.37 nests/mile in 2004 vs. 0.58/mile in 2003 vs. 1.0/mile in 2002 vs. 0.65/mile 1991-2003 average). Average clutch size near the Hudson Bay coast (2.69 eggs vs. 3.86 1981-2003 average) was the lowest recorded (1979-2004).

*Survey Results and Hunting Regulations:* The harvest management objective for the EPP is “to provide sustained hunting opportunity and harvest of EPP Canada geese that are consistent with the 1988-97 average population of 200,000 geese (145,000 geese represented by pairs and single geese)” and will be implemented according to the following strategies and population thresholds:

**Breeding ground estimate of singles and pairs between 120,000 and 170,000:**

Implement regulations for EPP harvest similar to those in 1993-94 (the season during 1993-94 was the 25% reduction season from the 1992 EPP Plan).

**Breeding ground estimate of singles and pairs between 95,000 and 120,000:**

Implement regulations that will result in a 25% reduction in EPP harvest until the breeding population reaches or exceeds 132,500 birds.

**Breeding ground estimate of singles and pairs at or below 95,000:**

Implement regulations that will result in a 50% reduction in EPP harvest until the breeding population reaches or exceeds 132,500 birds.

**Breeding ground estimate of singles and pairs exceeds 170,000:** Implement regulations to allow a 25% increase in EPP harvest until the breeding population reaches 145,000. An increase in harvest opportunity may not be considered if a production bust is indicated.

**Production bust indicated:** Implement regulations that will result in the next lower level of harvest reduction for the bust production year. Harvest restrictions also will be factored into recommendations if a bust in production occurs during years when the EPP is above 170,000 or below 95,000. Poor production will be indicated by: 1)  $>625$  heating degree days in May at Churchill, Manitoba, and 2) no nests initiated by May 23 at Cape Churchill, Manitoba.

From 2001-2003, EPP numbers were near the 2000 EPP Plan threshold criteria for more restrictive regulations (120,000 singles and pairs). The 2004 estimate ( $145,500 \pm 19,800$ ) is near the 2000 Plan objective of 145,000. However, much of this estimate was comprised of pairs that did not exhibit nesting behavior. Breeding phenology was the latest recorded (1976-2004) and a production “bust” was indicated according to criteria in the 2000 EPP Plan. In 2004, May heating degree days (807) were above the 625 heating degree days threshold indicated in the 2000 EPP Plan and geese did not initiate nesting at Cape Churchill until 4 June, well after the threshold of 23 May (D. E. Andersen, pers. comm.). Furthermore, all indexes from Nestor One indicate that 2004 will likely yield the lowest productivity recorded for Canada geese at Cape Churchill (1976-2004). The study crew observed the lowest density of Canada goose nests (0.82 per 100 ha vs. the 1994-2003 average of 5.7 per 100 ha), the smallest clutch size (2.2 vs. the

1994-2003 average of 4.0), and the latest expected median hatch date (11 July vs. the 1994-2003 average of 24 June) at Cape Churchill (D. E. Andersen, pers. comm.). We project a fall flight lower than 2002, potentially with few young geese.

### **Mississippi Valley Population:**

Spring 2004 was the latest on record for the MVP population. Although the total population estimate of 726,979 represents a 27% increase from 2003, this count was likely inflated by the presence of molt migrating giant Canada geese from the south. There were 23% fewer nests during 2004, and the average clutch size was the smallest recorded. Reduced nesting effort, low clutch sizes, cold wet weather during incubation, and early brood rearing will contribute to poor production in 2004. A much lower fall flight of MVP Canada geese is expected.

### **Tallgrass Prairie Population:**

Tallgrass Prairie Population Canada geese are much smaller than other Canada geese found in Missouri. They nest primarily on Baffin Island and winter in Louisiana, Oklahoma, Texas and northeastern Mexico. Missouri is on the eastern edge of their migration route. Because they nest in the high arctic, production is often affected by weather and late snow melt. Limited information suggests that spring breakup during 2004 was near average but later than 2003. Lower clutch sizes were found in a sample of nest searches. Based upon this limited information, production is expected to be somewhat lower than 2003. Surveys and banding conducted during August will provide up-to-date information on the status of this population.

### **Giant Canada Geese:**

Giant Canada geese are native to prairie portions of the Upper Midwest and they were common in portions of Missouri during pre-settlement times. Giant Canada geese were thought to have become extinct by the late 1800s but have now been restored to most of the eastern U.S.

**Table 5. Estimated spring population of giant Canada geese in the Mississippi Flyway and Missouri.**

Year	Mississippi Flyway	Missouri
1993	810,900	30,300 ( $\pm$ 18,000)
1994	1,002,950	35,050 ( $\pm$ 19,400)
1995	1,030,600	32,200 ( $\pm$ 14,200 )
1996	1,132,354	38,870 ( $\pm$ 19,530 )
1997	1,038,677	41,020 ( $\pm$ 22,860)
1998	1,214,798	44,825 ( $\pm$ 8,816)
1999	1,234,096	56,750 ( $\pm$ 10,987)
2000	1,497,444	77,128 ( $\pm$ 27,710)
2001	1,370,967	50,517 ( $\pm$ 14,934)
2002	1,612,349	64,222 ( $\pm$ 24,045)
2003	1,631,003	62,806 ( $\pm$ 19,519)
2004	1,582,200	65,172 ( $\pm$ 29,976)

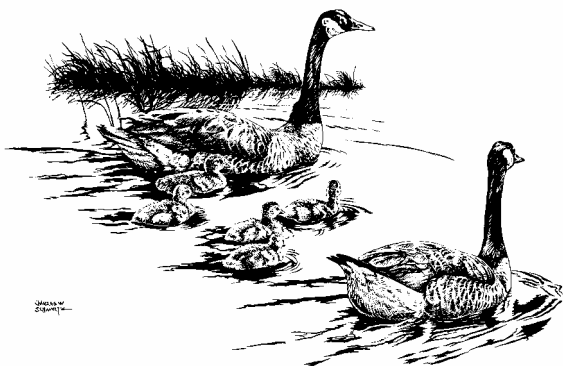
A cooperative breeding population survey was developed and has been implemented in at least 6 Mississippi Flyway states since 1993. This survey requires the use of helicopters to conduct low level counts on randomly selected 2 mi<sup>2</sup> plots. Additional states cooperate in the survey using

fixed wing aircraft, ground counts, or extrapolations from known density areas to habitats in non-surveyed areas. An initial Mississippi Flyway estimate of 810,900 giant Canada geese in 1993, increased to a high of 1.63 million by spring 2003. The spring 2004 estimate of 1.5 million is similar to the estimates of the past two years (Table 5). These estimates are considered conservative due to the inability to survey some urban locations. In Missouri, the 2004 survey was conducted during 5 days from April 5-9, resulting in a giant Canada goose population estimate of 65,172 ( $\pm 29,976$ ), similar to estimates of 62,806 and 64,222 during 2003 and 2002, respectively. The population estimate increased from 30,300 during 1993 to a high of 77,128 during 2000 but appears to have leveled off since (Table 5). Canada goose control activities and harvest regulations focusing on giant Canada geese appear to be impacting the rate of population growth of giant Canada geese in Missouri.

**Table 6. Results of the 2004 giant Canada goose survey in Missouri.**

Strata	# Plots	geese/plot	Prs	PN	S	SN	Groups	Total	Est. geese
High	10	5.5	12	1	8	1	20	55	4,637
Medium	29	4.3	27	12	8	1	39	126	19,348
Low	91	1.8	30	16	12	1	85	190	41,187
Total	130		69	29	28	3	144	371	65,172

A total of 150 random 2-square mile plots were selected to be surveyed and 130 were flown requiring 36.5 helicopter hours. Ninety-one, 29, and 10 plots were flown in low, medium and high density strata, respectively. Selected but not flown were a total of 19 low density plots; 16 because no water was identified on the topographic map and three were too far for the time and fuel to allow. One medium density plot was not flown because it was too far for the time and fuel to allow. The 16 plots with no water were assumed to have zero geese and were included in the estimate as if they were flown but no geese were present.



A summary, by strata, of the area and number of plots flown, and the break-down by breeding status (pairs, pairs w/nests, singles, singles with nests, and geese in groups) is shown in Table 6. The mean number of geese observed per plot was 5.5, 4.3, and 1.8 for high, medium and low density plots, respectively. The estimated (expanded) number of geese present for each stratum is also shown in Table 6. Not selected for survey was an area of 6,347 potential plots in the

forested hills of southeast Missouri where few or no geese are known to be present.

**Banding:** Canada goose roundups were conducted in eight general locations during June, 2004, and a total of 3,930 geese were captured. Of these, 2,048 were banded and released, and band numbers on 1,882 “recaptures” were recorded before they were released. The ratio of immature to adults was 0.21.

**Table 7. Results of Canada goose roundups in Missouri – June, 2004.**

Area	Banded & Released				Total Banded	Retakes	Total Captured
	AM	AF	LM	LF			
St. Louis *	187	151	50	115	503	458	961
Taneycomo	75	46	41	28	190	288	478
Bull Shoals	1	0	7	10	18	16	34
Pony Express	76	85	20	20	201	406	607
Central MO	88	53	113	128	382	237	619
Smithville							
Lake	153	125	28	32	338	449	787
Southeast MO	15	10	33	32	90	24	114
Kansas City	131	170	10	15	326	4	330
Total	726	640	302	380	2,048	1,882	3,930

\* Banding totals does not include 2 of unknown age and sex

*Giant Canada Goose Control Activities:* Canada goose population control activities were conducted for the 4<sup>th</sup> year under a Special Purpose Canada Goose Permit issued to the Missouri Department of Conservation (MDC). This permit allows MDC to issue “sub-permits” to private citizens (who have suffered property damage by Canada geese) to destroy nests, to carry out lethal control of adult Canada geese, and to transport hatching year birds to a designated location to be released.

A total of 699 nests (3,655 eggs) were treated to prevent recruitment into the local population and a total of 435 adult geese were destroyed. Adult geese were transported to a meat processing plant to be donated to a food bank. Seventy-seven hatching year birds were transported from damage sites to a rural location and released. Results of damage control activities during 2004, compared with past years, are shown below.

**Table 8. MDC 2004 goose permits - total by region.**

Region	Eggs Destroyed	Nests Destroyed	Geese Destroyed	Geese Relocated
Northwest	82	16	0	0
Northeast	8	1	2	0
Kansas City	1,193	235	316	16
St. Louis	1,691	322	74	53
Southwest	103	22	3	0
Ozark	-	-	-	-
Central	504	89	40	8
Southeast	74	14	0	0
<b>2004 Total</b>	<b>3,655</b>	<b>699</b>	<b>435</b>	<b>77</b>
Previous years				
Totals				
2003 Totals	4,434	832	525	48
2002	4,289	802	464	68
2001	3,885	772	262	64



### White-Fronted Geese:

The Mid-continent Population of greater white-fronted geese nests across a broad region of the arctic from Alaska to the Foxe Basin. They concentrate in southern Saskatchewan and Alberta during migration and winter primarily in Texas, Louisiana, and Mexico. The 2003 fall inventory of mid-continent white-fronted geese was conducted in Alberta and Saskatchewan from September 25 - October 1. The 2003 survey yielded 528,200 white-fronted geese in Alberta and Saskatchewan, 17% fewer than the previous year. These results provide a new 3-year (2001-2003) average of 625,900 geese, 22% fewer than the previous mean of 805,700 birds. Overall, production of white-fronted geese is expected to be somewhat lower than 2003. This is the 4th consecutive year that the fall survey has suggested a decrease in the fall flight. If the fall 2004 survey continues this trend, harvest regulation adjustments will likely be considered for the 2005 regulations cycle.

### Light Geese:

The term light geese includes snow (blue and white color phase) and Ross's geese. Breeding colonies on Baffin and South Hampton Island and along the west coast of Hudson Bay are the primary sources of lesser snow geese present in Missouri during fall through winter. However, light geese from throughout the arctic may be present especially during spring migration. Although lesser snow geese are more common, increasing numbers of

Ross's geese have been noted in Missouri and the Mississippi Flyway in recent years. This appears to be due to an increase in numbers of Ross's geese throughout their range and to increased numbers of nesting Ross's geese in the eastern arctic. Weather during spring 2004 was highly variable over much of the arctic and goose production may vary greatly depending upon the location of the breeding colony. Goose arrival and nesting were likely delayed by snow cover near Hudson Bay. This may have affected clutch sizes and overall nesting effort on northern areas.

The 2004 Midwinter Waterfowl Survey resulted in an estimate of 2.15 million mid-continent light geese, which is 12% fewer than last year. After peaking at nearly 3 million in 1998, the light geese population appears to have declined by about 2% per year. In Missouri, a total of 467,217 light geese were counted during the 2004 Midwinter survey, 18% fewer than during 2003. A decline in mid-continent light geese since 1998, combined with increasing recovery rates and decreasing survival rates in some areas, hopefully is a signal that population control efforts are beginning to have an impact on numbers of mid-continent light geese.

**Figure 13. Numbers of mid-continent light geese counted during the Midwinter Survey.**

